

the *circumvallate* and *fungiform* varieties of the compound papillæ, have a structure in all respects similar to that of those just described; but when situated over the *filiform* papillæ, they present some distinctive peculiarities, being larger and more pointed, also possessing considerable stiffness and elasticity; the latter quality depends on a quantity of yellow fibrous tissue which they contain, and which, with a wavy, almost spiral character, runs in a general longitudinal direction up the papilla. Nerve-fibres are commonly found within this variety of the secondary papillæ, especially when examined near the apex of the tongue. Occasionally the authors have noticed these nerve-tubules to terminate in loops,—probably they all do so. Besides these peculiarities in their secondary papillæ, the *conical* or *filiform* variety of the compound papillæ are distinguished by the peculiar form which their name expresses; also by “their whitish tint, derived from the thickness and density of their epithelium. This epithelium, indeed, frequently composes two-thirds of their length, being sent off from the sides and summits of their secondary papillæ in long pointed processes, which are immersed in the mucus of the mouth, and may be moved in any direction, although they are generally inclined backwards. These epithelial processes are more stiff according as the particles of which they consist approach more nearly to the dense texture of hair; and a few among them actually enclose minute hairs, pointed at the end, and provided in some cases with an extremely fine central canal. One of the largest found was one-tenth of an inch long, and from 1-2000th to 1-3000th of an inch thick.” Others of the processes have a more or less imbricated arrangement of the epithelial particles, in all of which the imbricated particles tend to coalescence towards the point. Many of the processes may be regarded as soft or uncondensed hairs, and preserve the same thickness for a considerable length.\* From the structural peculiarities of these filiform compound papillæ, the thickness of their epithelial covering, the stiff brush-like character of their filamentary productions, together with their greater development in the middle part of the dorsum of the tongue, which part is chiefly employed in the movements of mastication, and least endowed with the function of taste, the authors infer the subservience of these papillæ to the purposes of mastication rather than to the function of taste; whilst the simple papillæ at the base of the tongue, and those covering the *circumvallate* and *fungiform* papillæ, being invested by a comparatively thin layer of epithelium, which would readily permit a speedy transudation of sapid substances dissolved in the mucus of the mouth, are doubtless the organs concerned in the sensation of taste, a supposition which receives confirmation from the fact of this kind of simple papillæ being most prevalent in those parts where the sense of taste is most acute, namely, the base, sides, and apex of the tongue.—*Ibid.*

7. *Function of Taste.*—Some precise and interesting conclusions respecting the seat of, and the nerves concerned in, the function of taste, are given by Todd and Bowman, in the same chapter from which the above account of the papillary structure of the tongue has been taken. It seems most probable that the entire dorsal surface of the tongue possesses the property of taste; but especially the circumferential parts, namely, the base, sides, and apex; whilst the central part of the dorsum, in which the sense of taste is feeble, is especially adapted, by the denseness and roughness of its epithelium, (very marked in some animals,) to aid in the comminution and dispersion of the food. The soft palate and its arches, with the surface of the tonsils, also appear to be endowed with taste in various degrees in different individuals; not so the pharynx, gums, or other parts. The above conclusions are warranted by the results both of disease and of careful experiments; and a further consideration of them shows, that since the base of the tongue, which is supplied solely by the glosso-pharyngeal nerve, and the anterior part, which is supplied solely by the lingual branch of the fifth pair, are both endowed with the sense of taste, both these nerves must contribute to the production of this sense; probably a share ought also to be attributed to the palatal branches of the fifth. The tongue is also an exquisite organ of touch, especially

\* The character of these hair-like epithelial processes will be best understood by referring to the admirable illustrations of them given in Todd and Bowman's book: the copious illustrations throughout the work are all most excellent.

the sides and tip of its anterior portion. The question, therefore, arises whether the senses of touch and taste reside in the same papillæ, or in distinct ones, which, since so far as we now know, there is no anatomical distinction between nerve tubules of different endowments, it is impossible to decide; there seems no difficulty, however, in conceiving that a single papilla may receive nerve fibres of different endowments, and thus, in the case of the tongue, one and the same papilla may be subservient to the functions both of touch and of taste.

Several interesting cases have been recorded, which prove that the fifth pair of nerves is concerned in the sensation of taste; one by Todd and Bowman, (p. 444,) in which a middle-aged man suffered for eight years from complete loss of sensation in all parts supplied by the fifth nerve on the left side, with the exception of the forehead. The left eye was lost by destructive inflammation; the tongue was quite without feeling on the left side. His sense of taste was found perfectly absent in the anterior and middle part of the affected side; but not impaired behind, in the region supplied by the glosso-pharyngeal nerve. On the opposite side of the tongue his taste was quite acute in front. Two other cases of paralysis of the fifth pair are related by Mr. James Dixon.\* In both, common sensation and the function of taste were unimpaired on the sound side of the tongue; but were both entirely lost on the anterior part of the affected side, whilst posteriorly, where the tongue is supplied by the glosso-pharyngeal, its functions were unimpaired.—*Ibid.*

8. *Effects of Alcohol on the exhalation of Carbonic Acid from the Lungs.*—Dr. VIERDONT, in his researches on respiration, finds that immediately after drinking any spirituous liquor, the amount of carbonic acid exhaled becomes sensibly diminished, and that this diminution lasts for about two hours.—*Gaz. Méd.*, Oct. 4.

If this be correct, the retention of carbonic acid in the system may explain some of the distressing effects resulting from the use of ardent spirits.

## ORGANIC CHEMISTRY.

9. *On the detection of Pus in the Blood and other Animal Fluids.* By J. F. HELLER.—It has hitherto been a matter of considerable difficulty to recognize the existence of pus in the blood; indeed it is still doubted by many whether pus cells do really circulate as such in the blood. Probably this difficulty will account for the discrepant accounts given by writers on the subject, some of whom state that the existence of pus in the blood is indicated by the peculiar aspect and qualities of this fluid, others by its microscopic characters, without, however, the pus cells being actually seen. The quantity of pus in the blood must be enormous; when in a single drop of this fluid, taken from the 20 to 30 pounds existing in the body, we are enabled to detect its existence beneath the microscope. Therefore from such a mode of examination, no certain results can be expected, and no conclusions, *pro* or *con*, can be drawn.

Two cases having occurred to Heller, in which the blood contained a very large quantity of pus, he took advantage of the opportunity, and performed a number of experiments in reference to the detection of pus, and obtained from them some decided results.

He found that if there is only a small quantity of pus contained in the blood, this fluid presents few or even not any peculiarities which can be ascribed to the presence of pus. The more pus there is in the blood, by so much the more is the quantity of fibrin diminished; indeed, if the quantity of pus be very large, the fibrin disappears entirely, so that not a trace of it can be found in blood drawn from a vein by venesection. In such a case there are observed, after death, unusually large deposits of fibrin in the great vessels and in the cavities of the heart. He noticed that when blood containing pus is entirely deprived of fibrin, the blood corpuscles subside sooner than the pus cells, so that these latter form above the

\* *Med. Gaz.*, July 18; abstract of paper read to the Medico-Chirurg. Society, June 24.